

# **A Profile of the**

# **Dunstable Water Department**

**Original 2012**

**Updated 2014**





## Dunstable Water Department

Dunstable has a limited centralized public water supply with 102 connections. The majority of these connections are residential. However, the Swallow Union elementary school, municipal facilities (fire station, police, library, post office) and a small assortment of commercial properties are also connected to the system.

Dunstable Water Department is a community public water supply and serves a drinking water population of approximately 234 persons per day. The Dunstable water supply distribution system covers approximately 5 miles and the infrastructure is made up of a variety of water main pipe sizes and material - unlined cast iron pipe that is 100 years old in some places. According to the Water Supply, Distribution & Storage Study prepared in 1998 by the Board of Water Commissioners (BWC) with Tata & Howard and the Dunstable Open Space Plan, the DWD provides water to about 10% of the Town population. The remaining residents obtain their water from individual on-site wells

## Supply

The Dunstable Water Department (DWD) obtains its water supply from two (2) gravel packed wells, a main and backup well, located about 200 feet from the Salmon Brook. The Water Department contracted Tata & Howard, Inc. to delineate the Zone II recharge area and site a backup well source for the Town. Funding for the backup well was approved and voted for in a Special Town Meeting held on October 25<sup>th</sup> 2004.

The new well approved for activation on December 12<sup>th</sup>, 2006. The backup well is to ensure redundancy in the water supply system. The two wells are considered to be a "High" risk for susceptibility to contamination by the existing land uses within the primary recharge region of the Zone II areas.



Salmon Brook

The main wellhead for Dunstable's water supply is the Salmon Brook Gravel Packed Well (DEP #2081000-02G). In accordance with state regulations, a backup well (DEP #2081000-03G) for the Salmon Brook public water supply went online in December 2006. The backup well provides important redundancy and is designed to pump 360,000 gallons per day (GPD) at capacity. Zone II for both wells cover just over 440 acres in the central part of Town. Though both wells have the capacity to provide 360,000 gallons per day (GPD), the estimated daily output is approximately 30,000 (GPD). The majority of Dunstable is served by private on-site wells. In general, there is little difficulty siting all private wells. However, there have been isolated cases where individual lots were unable to produce adequate volumes of water supply.



An ongoing concern is the adequacy of the existing fire hydrant system. The fire hydrants are not able to supply adequate volumes of water in case of an emergency, except in certain locations. Dunstable may be reliant on tank trucks to deliver water from other sources, i.e. neighboring towns, to handle a fire emergency. To address the need for more water volume and to prepare for future development, the DWD is in the process of identifying sites that may be feasible for constructing a water storage tank. The DWD suggests that a 300,000 gallon capacity system is necessary to accommodate the future needs of the community. As for now, the plans for a water storage tank are on hold due to costs associated with such a large capital project.



Today the DWD water storage facility consist of two 5,000 gallon below ground steel hydropneumatic storage tanks. The hydropneumatic tanks maintain system pressure between 55-66 PSI. A pressure switch associated with the hydropneumatic tanks controls the booster pumps. These aging tanks will need to be addressed in the near future.

### **Distribution System**

The service area has 102 service connection which consists of 93 residential, 4 industrial/commercial, and 5 municipal connections. The water system consists of two wells, which provide 100% of the water, two pump stations with water treatment facilities, two booster pump stations, and two water storage facilities located in the distribution system. The water system uses an average of 26,455 GPD. Dunstable Water Department is classified as a class 1-distribution system as defined in 310 CMR 22.11B(4)(c). The treatment facilities are classified as a class 1-treatment. Water pressure is provided by two (2) hydropneumatic tanks. The water system has one pressure zone. The water pressure is maintained between 52-98 PSI. The operation of well pumps is controlled automatically by a pressure switch associated with the hydropneumatic tanks. The water flow is metered at each pump station, and at approximately 100 % of the service connections. There is an Aquifer Protection District Zoning By-law, Water Use Restriction By-law, a Board of Health Floor Drain regulation, a cross connection By-law, approved Zone II's for each of the wells, and emergency backup power supply. The Zone I for each well is a 400-foot radius around the head. The DWD does have a proactive cross connection control program. The DWD Treatment Facility receives water from the both source wells. The untreated water from the wells has a pH of approximately 6.3 and is corrosive to pipes (Note as an example **Coca-Cola®** products range in **pH** from 2.5 - 4.2, so Dunstable water is drinkable without treatment. The treatment is to protect pipes.). The Dunstable Water Department currently adds potassium hydroxide to the drinking water to increase the pH of the water.



The Potassium Hydroxide feed system consists of a 1,500 gallon bulk tank, a 45-gallon day tank with secondary containment area; two wall-mounted positive displacement chemical feed metering pumps, a calibration column, and a pH analyzer for continuous monitoring of the pH. Each chemical feed metering pump is equipped with a four function valve, a check valve to prevent backflow and siphon, and a pressure relief valve. Several control circuits serve to assure proper operation of the chemical feed systems. The chemical addition process cannot be activated until the well pump motor is energized, and the pH of the finished water is within acceptable limits.

The treatment system is equipped with a high/low pH alarm. All pumps shutdown on alarm and require a manual reset and restart of the facility. The chemical metering pumps injection rate is adjusted and injected at a constant rate fixed speed and stroke. Emergency shower/eye wash, protective clothing and eye wear are provided at all facilities. Raw and treated sample taps are also available at each facility for sampling.

The DWD water system has a propane powered backup generator in place that is automatically engaged in the event power failure conditions occur.

The DWD water systems is equipped with a wireless alarm system configured for monitoring all operational aspects of the distribution system as well as notify designated DWD personnel should emergency conditions occur. DWD conducts scheduled testing of all critical controls and alarms associated with the over-feed and under-feed of critical chemicals as identified in Chapter 6.1.3.6 of the Massachusetts Department of Environmental Protection's (MassDEP) guidelines.

### Water Quality

Water: a tasteless and odorless liquid with the chemical formula H<sub>2</sub>O. When water has certain minerals dissolved in it the taste can be very good. However, too much of the wrong mineral can leave water with a very bad taste and sometimes a bad smell. When companies advertise the purity of their water they are referring to the absence of toxins, pollutants, and microbes.



Dunstable Water: ***It's simply delicious!*** The Dunstable Water District is required by law to have the water from its wells tested periodically.

No microbes have ever been detected. A good balance of minerals, such as calcium, potassium, manganese, sodium, and zinc, are present with concentrations that give the water its great taste. Minerals that can be harmful, such as arsenic, mercury, antimony, thallium, are below the detection limits.



Synthetic organic compounds, Carbamates, pesticides, herbicides, and volatiles are all ND, non detectable. The result is a water supply that meets or exceeds the best spring waters you can buy.

*Note: An example of the laboratory water analysis for Dunstable is available on the DWD website.*

In order to ensure that tap water is safe to drink, MassDEP and the Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

Last year, as in years past, water supplied by the Dunstable Water Department (DWD) met all federal and state drinking water quality standards. The Department vigilantly safeguards its water supplies and we are proud to report that our system has not exceeded any maximum contaminant level or other state or federal water quality standard.

See ***Dunstable 2012 Consumer Confidence Report (CCR)*** available on the DWD website @ [http://dunstable-ma.gov/Pages/DunstableMA\\_Water/index](http://dunstable-ma.gov/Pages/DunstableMA_Water/index)

### **Sewer System**

There is no public sewage system in Dunstable. All wastewater treatment is done through onsite septic systems. Most 2-acre lots must provide their own water source and their own wastewater treatment onsite. Careful siting, installation, and maintenance of septic systems is essential to protect water quality. There is no other treatment option readily available to the Town.

### **Water System Protection Zones**

Dunstable's Wellfields have a Zone I and II delineation. Zone I is the most protected area around a groundwater source and extends in a 400-foot radial area around each of the wellheads. The radii of the Zone I and II for the wells are based on estimated yields of the wells as determined from pumping tests conducted on each well. Dunstable's Wellfields were delineated by Tata & Howard in 2005.

The delineation of the Zone II was funded through the Massachusetts Department of Environmental Protection's (MassDEP) Source Water Assessment Program (SWAP) Zone II delineation project. The Dunstable Wellfields were selected for inclusion in this project based on a comparison to the following set of criteria: 1) real or threatened impacts to water quality, 2) the absence of a regulatory vehicle for requiring the water supplier to delineate Zone II and 3) recommendations from MassDEP regional offices. Dunstable belongs to the MassDEP Central Region supported out of the regional office in Worcester MA.



The Zone II's for the Salmon Brook Wells were delineated by the Tata & Howard report using conceptual modeling methods including:

- A review of existing mapping to determine hydrogeologic features such as aquifer boundaries and regional groundwater flow.
- An analysis of available pumping test records or well logs to estimated aquifer hydraulic properties. Pumping rates (well yields) were based on records provided by MassDEP.

A field survey of the land uses and potential contamination sources (PCSs) was carried out by the MassDEP during the process of creating Dunstable's SWAP Report. The Dunstable Source Water Protection Plan updates the 2003 PCS survey to reflect the state of potential contamination sources present in 2006-2011. A detailed description of potential contamination sources is addressed in DWD documents on file.

### **Water Supply Protection District**

The Town of Dunstable has adopted a Water Supply Protection District (WSPD). The WSPD is intended to protect lands within the primary recharge area of groundwater aquifers and the watershed areas of reservoirs which now or may in the future provide public water supply. To protect surface and groundwater resources, the WSPD overlay district prohibits many noxious uses such as solid waste disposal facilities, disposal of liquid or leachable wastes, and storage of petroleum products. Commercial or industrial uses that are allowed in the underlying district require a Special Permit.

The overall purpose of the WSPD zoning By-law for Dunstable is to promote the health, safety, convenience and general welfare of the inhabitants of the Town of Dunstable, and to provide the Town with the protection authorized by the Massachusetts General Laws, Chapter 40A. In general, the WSPD By-law intends to separate possible conflicting land uses. The long-term development patterns of Dunstable will be determined by the current zoning and zoning By-laws. These regulations influence development, both in its type and location. Development can be excluded or highly regulated in certain areas such as Reserved Land, Water Supply Protection Districts, Scenic Districts, and Flood Plains.

### **Capital Improvements**

The Dunstable Water Department continues to develop and manage a capital improvement plan to address certain areas of the present distribution system infrastructure targeted for renovation or new installations. Please note that any of these improvement items need to be addressed and resolved prior to any future development being investigated by any Town Dept or Board.





i.e. - Board of Selectmen and the Mixed Use Dev District (MUDD) project targeted for behind the post office)

- Any possible 40B project

Below are just some of the key items under investigation and consideration.

- The hydropneumatic tank facility is an integral part of the DWD Distribution System and it contains a number of aged components. As such, it is diligently monitored on a regular basis for any compromised operations or abnormal conditions. DWD has considered taking some actions to renovate some of the system configuration but there is much concern with the age of the equipment. An alternative solution is to construct a new storage / pressure facility, but present department budget conditions prevent any immediate action.
- There are sections of water main within present Distribution System that need to be upgraded. The majority of the system is made of 12" Ductile Iron water main pipe, but many sections still contain 4", 6", or 8" cast iron or asbestos lined pipe. The system configuration is a main line running a course on Rt 113 and Main St. with "dead-end branches" coming off to various side roads. Ideal conditions of a water distribution system are experienced when there is a continuous flow of water throughout the system – i.e. no dead ends. The DWD system would be better served if there was a connection from Main St. to Depot St. to Brook St. to Rt 113. This type of system modernization continues to be a part of the DWD Master Plan.
- Ongoing research for incorporating a storage tank into the DWD Distribution System infrastructure is being conducted. This item continues to be a suggested course of action by MassDEP and adding such a critical component to the system would present many positive benefits to the entire Town of Dunstable – not just the DWD rate-payers. The Board of Water Commissioners continues to investigate the types of studies and needed resources to take on such a project.



Dunstable Wellfield



#### Massachusetts WARN

(Water/Wastewater Agency Response Network) allows public water and wastewater systems in Massachusetts to receive rapid mutual aid and assistance from other public systems in Massachusetts to restore services damaged by natural or man-made incidents. Public utilities sign the MAWARN standard agreement, which then allows them to share resources with any other public system in Massachusetts that has also signed the standard agreement.

#### More Info

For more information on the Dunstable Water Department and the DWD Distribution System please visit the DWD website @ [http://dunstable-ma.gov/Pages/DunstableMA\\_Water/index](http://dunstable-ma.gov/Pages/DunstableMA_Water/index)

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<b>COMM MEETINGS:</b>	4th Tuesday evening of month @ 7:00pm Dunstable Town Hall 511 Main Street Dunstable, MA 01827 lower level
<b>Hours:</b>	Mon-Thurs, 7:30 -3:00



Join us at our monthly  
Water Department meeting